

Duralumin

Duralumin is an alloy, a trademark name given to the earliest types of the age hardenable [aluminum](#) alloys. It is an alloy made up of 90% to 94% aluminum, 4% [copper](#), 1% [magnesium](#) and 0.5% to 1% [manganese](#). It is a very hard alloy. These alloys are used in places where hard alloys are required, for example in the vehicle armor that is used in the defense industry. These alloys were the first widely used deformable aluminum alloys.

Duralumin is hard, but a lightweight alloy of aluminum. It has a typical yield strength of 450 MPa, and there are a few other variations, that depend on the composition, type, and temper.

Duralumin Metal

Duralumin is actually a metal, which is an alloy of aluminum, copper, magnesium, and manganese. Duralumin is a special kind of metal and is made strong by subjecting it to heat treatment. It may be well spun, tempered, riveted, welded, or machined. The duralumin, which is effectively given heat treatment, can be effectively being resistant to corrosion. It can carry heavy loads and is ductile. It is especially suited for aircraft construction.

When copper is added to the alloy, its strength increases, but then it also makes it susceptible to corrosion. For the duralumin sheet products, the metallurgical bonding of the highly pure metal layer can increase the corrosion resistance. These sheets are called alclad, and are generally used by the aircraft industry.



Picture 1 – Duralumin

Source – en.ccmotor.cn

Duralumin Properties

Duralumin is a strong, light-weighted, and hard alloy of aluminum. It is also reflective and impermeable. It is a malleable metal and can be easily shaped. It is a very good conductor of heat and electricity. It is odorless, and reacts with the [oxygen](#) that is around, and forms aluminum oxide. It is resistant to corrosion. It has a thin surface, which is made up of a layer of pure aluminum, which is corrosion-resistant and covers the core of the strong duralumin. Generally, Duralumin alloys are soft, ductile, and workable when they are in a normal state. They can be easily rolled, folded, or forged. They can also be drawn into a variety of shapes and forged. It has a high strength, which can be easily lost during welding. So it can be easily transformed, and hence is used in aircraft construction. It is suited for aircraft construction because of its lightweight and high strength.

Duralumin Uses

Duralumin has the following uses:

- It is used for making wire, bar, and rods for screw machine products. It is used in places where good strength and good machinability are required.
- It is used in heavy-duty forgings, wheels, plates, extrusions, aircraft fittings, space booster tankage and truck frame, and other suspension components. It finds applications in places where high strength is required, and services at elevated temperatures.
- It is used for making Aircraft structures, truck wheels, screw machine products, rivets, and other structural application products.
- It is used as a sheet for the auto body panels.
- It is also used in forgings, in aircraft engine pistons, impellers of the jet engines, and compressor rings.
- It is also used for making die and hand forgings.

There is a proper method that is used for the conversion of Duralumin into ingots. It has to undergo high pressure before being converted to ingots. This pressure treatment includes rolling, pressing, and so on. It is then converted to plates, sections, sheets, tubes, and wires. It is quenched in water at a temperature of about 500 degrees Celsius, for about four days. This is called natural aging. Often, it undergoes artificial aging at a

temperature of about 190 degree Celsius, This heat treatment ultimately leads to the inculation of various strengths in duralumin. In fact, the initial period in which metal airplane was constructed with duralumin; it had to go through these processes. Duralumin is also used widely in surface transportation, aviation, and mechanical engineering.

References:

<http://en.wikipedia.org/wiki/Duralumin>

<http://www.encyclopedia.com/topic/duralumin.aspx>

<http://www.britannica.com/EBchecked/topic/174106/duralumin>

Related Articles



[Stellite](#)



[Vitallium](#)



[Ultem](#)